In the case under consideration, the first attempt, which was continued for two or three minutes, did not succeed, but a second effected the reduction.

MEDICAL JURISPRUDENCE.

32. *On the Detection and Identification of Arsenic in Complex Organic Mixtures.*—The *London Medical Gazette*, for Sept. last, contains some interesting observations on this important subject, by Dr. ROBERT VENABLES. "None but they who have practically satisfied themselves of the fact," says Dr. V. "would credit the minute—I may almost say the evanescent—proportion in which poisons are usually found in the contents or tissues of the viscera of those who perish by their fatal operation. This arises from a variety of causes; but the two principal may be considered as vomiting and decomposition. By the former the great bulk of the poison is ejected, and frequently lost before the medical jurist arrives, or has an opportunity of providing against such a contingency. Indeed, vomiting—at least spontaneous vomiting—occurs under circumstances, and probably in situations, which preclude the possibility of identifying the vomited matters.

"The decomposition of the poison may be either natural or artificial. Natural decomposition is the result of the mutual agency of the stomach with its contents, and the poison, upon each other. In some instances the poison is the sole active agent, the decomposition arising from its action, (generally a corrosive one,) upon the tissues or substance of the viscera. Artificial decomposition is caused by the injection of antidotes, medicinal or alimentary, either purposely administered, or taken as food in the usual course. By these agencies the poison is so diminished in quantity, and so altered in both its sensible characters and its chemical constitution, as in no small degree to embarrass the medical jurist, and to render his duties not only intricate, but awfully painful and distressing.

"The two great difficulties then, in the way of medico-legal analysis, is the alteration in chemical constitution, and the minuteness of the quantity, compared with the bulk and complexity of the organic matters. The former may be easily obviated, because we can readily ascertain by experiment, the nature of the chemical decompositions; and being thus acquainted with the alterations so induced, we can provide the means of remedying these inconveniences. But the minuteness of the quantity, compared with the bulk and complexity of the matters for assay, is a source of embarrassment, against which we can oppose nothing but patience, assiduity, and the dexterity resulting from industry in the constant and habitual practice of medico-legal researches."

Dr. V. speaks in the highest terms of Dr. Christison's directions for the detection of poisons, but states, that there are some imperfections in it, which it is important, if possible, to remedy. "One is the occasional presence of organic products in intimate mixture, or combination with the precipitated sulphuret; and from which, in some peculiar instances, this process will not wholly free it. This will give rise to empyreuma, which, when the quantity of sulphuret is minute, will render the subsequent sublimation of reduced arsenic precarious. In some cases it is utterly impossible to wholly deprive the solution of animal or vegetable matter, and it will remain, and some of it fall down in combination or mixture with the sulphuret. Another difficulty is, that unless very great care be taken in regulating and applying the heat, so that the sublimation do not begin before the flux has attained a sufficient temperature, a portion of the sulphuret escapes decomposition, and sublimes, or sulphur alone sublimes, and when the crust of sublimed arsenic is very minute, obscures the result. But a most important objection is, that the sulphuret cannot be forced to yield above a third of the arsenic it contains.*** I have, after much and laborious inquiry, been induced to prefer the *arseniate of silver*, as superior to every other preparation, for the purposes of medico-legal reduction; and this for the following reasons:—First, its bulk is sufficient to enable us to operate upon minute quantities with infinitely greater ease and precision. Secondly, its superior specific gravity causes it to subside more quickly, even from saturated saline solutions; and hence it is more easily and speedily collected. Thirdly, it parts with moisture more readily, and does not cake, or attach itself to the capsule with that obstinate adhesion which renders the collection of the entire sulphuret, under similar circumstances so difficult; on the contrary, it is easily collected, and admits of being dried so thoroughly as to yield but little moisture. Fourthly, the salt itself presents an almost distinctive character in its brick-red colour. Fifthly, it yields on reduction, (cæt. par.) nearly three times the quantity of metallic arsenic afforded by any other compound, (so far as I know,) arseniate of lead being excepted; and nearly half as much more as even this salt.

"The process, therefore, which I find to answer best is the following:—Dr. Christison's directions are to be observed, and his plan precisely followed, till the sulphuret of arsenic is precipitated. The precipitate is to be allowed to subside, and the organic liquid poured off. The precipitate is then to be washed by the alternate affusion and decantation of distilled water after each subsidence. The sulphuret, after being thoroughly washed, is to be transferred into a deflagrating tube. When the quantity is very minute, its transfer is effected without loss in the following manner:—diluted ammonia is to be added till the whole of the sulphuret is dissolved, and the solution poured into the deflagrating tube; the precipitating jar is to be washed out with distilled water, the washings being added to the solutions in the deflagrating tube; acetic acid being now added in excess, the tube, with its contents, is to be gently heated, when the sulphuret is immediately precipitated.[*] The acetate of ammonia is to be poured off, and the precipitate is to be well washed in distilled water; the water is to be poured off; the sulphuret remaining at the bottom of the tube is to be rendered as dry as possible, by placing the tube by the side of a stove.[†] Nitrate of potass is next to be added, with which the sulphuret is to be deflagrated. By this process the arsenic of the sulphuret is peroxidated, and converted into arsenic acid, which unites with the potass set at liberty during the operation, and forms *arseniate* of potass. As soon as the nitrous acid, formed by the action of the nitrous gas, (evolved by the decomposition of the nitric acid of the nitre,) upon the atmospheric air is dissipated, and the tube has cooled, hot distilled water is to be added till the entire residue is dissolved. If the solution should be alkaline, which may happen if vegetable or other organic matters were present, in consequence of the formation of both carbonic acid and potass, or ammonia, a little acetic acid should be added, so as to render the solution perfectly neutral, or even very faintly acidulous. If the solution be now touched on the surface with a stick of lunar caustic, immediately a dense heavy brick-red precipitate falls down from the point of contact. The precipitate should be allowed to subside, and the caustic applied after each subsidence till the brick-red powder ceases to be formed. When the powder has subsided, the nitrous solution is to be poured off, and the precipitate is then to be well washed in distilled water till the washings, when evaporated upon platina foil, cease to leave any residue. The precipitate, which is arseniate of silver, perfectly pure, or nearly so, may now be transferred to a watch crystal, and dried either by the side of a stove or in a vapour bath. The dried salt is next to be mixed with boracic acid and recently-ignited charcoal, put into a proper tube, and reduced. Towards the end, the reduction may be aided by the cautious application of the flame of the blow-pipe. By this means a well-defined crust of metallic arsenic will be found lining the upper and narrow portion of the tube; nor is there the slightest obstruction to the reduction from the presence of impurities."

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[*] Boiling alone, by expelling the ammonia, would precipitate the sulphuret, but still not so completely as by adding acetic acid in slight excess.

[†] Æther frequently assists the drying of precipitates.

The process here detailed, says Dr. V. will only apply to the arsenous acid and its soluble compounds; nitrate of silver precipitating pure arsenic, and by single decomposition. "Hence it is evident," he adds, "that if arsenic acid existed in the mixture, or any of its compounds, the precipitation of the vegeto-animal matter by nitrate of silver would at the same time carry down the whole of the arsenic acid, while the fluid for assay would be thus entirely freed from arsenic, and of course afford no indications whatever upon applying sulphuretted hydrogen. In order to obviate this inconvenience, when the circumstances are such as to afford no clue to the preparation to be sought for, or even but doubtful information on this subject, I should advise the following, which I have found to answer under almost every possible contingency. It is a modification of one of Orfila's processes, and will apply, in its extended form, to every preparation of arsenic.

"The contents and tissues of the stomach, the solids being previously cut into small shreds, are to be well boiled in nitric acid till as much of the animal matter as possible has been destroyed, distilled water being added according to circumstances. It is now to be filtered, potass added in slight excess to the filtered fluid; and it is next to be acidulated with acetic acid, when a stream of sulphuretted hydrogen gas is to be passed through it. If a yellow precipitate separate, it should be deflagrated with nitre, and treated as already directed in a preceding part of this paper.

"By the boiling with nitric acid, not only all the preparations of arsenic, soluble in this menstruum, and water, are taken up, but by far the greater proportion of the organic matters are destroyed. The soluble preparations of arsenic pass through the filter, and are subsequently precipitated by the sulphureted hydrogen.[*] Such preparations, however, as may not be soluble in nitric acid and water, remain upon the filter, consequently it becomes an object of medical jurisprudence to determine their presence. For this purpose the products retained on the filter should be collected and dried, and they should then be projected in small masses, or portions at a time, into a Florence flask, containing a tolerably large proportion of nitre in a state of fusion, containing the heat. By these means only slight scintillations take place, and all the organic matter is destroyed, being converted into water, carbonic acid, potass, and ammonia. Any arsenic, under whatever variety or form it may have been present, is at the same time peroxidated and converted into arsenic acid, which, uniting with the alkali, forms a soluble arseniate. Nitrate of silver, applied as before recommended, precipitates arseniate of silver, which is to be reduced in the manner already explained.

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[*] Rose says the free sulphur is always deposited along with the sulphurets precipitated from arsenical solutions by sulphuretted hydrogen. If this proposition be well founded, it will readily account for the obscurity and obstruction frequently experienced in the subliming of minute quantities of metallic arsenic in the operations under consideration. It will also account for the yellow, or yellowish red ring, which I have already noticed as occasionally surmounting the metallic crust obtained by the reduction of the sulphuret of arsenic by some of the preceding processes, and offers an additional reason for endeavouring to obtain a pure preparation of arsenic for reduction by the deflagration of the sulphuret. However, it may be observed, with respect to the assertion of Rose, "that the free sulphur is produced by the decomposition of the sulphuretted hydrogen which existed in the solution," that this decomposition is owing to the action of the *acid*, which he invariably uses for acidulating the arsenical solution, and which is the muriate, or hydrochloric acid. When the acetic acid is used for this purpose, there is never any separation of free sulphur, diluted acetic acid exerting no sensible chemical action upon sulphuretted hydrogen unless animal or vegetable matter be present; then free sulphur is deposited. If an acetic acidulous solution of arsenic, in distilled water, be precipitated by sulphuretted hydrogen, the whole of the precipitate is soluble in caustic alkali, or ammonia; nor will the slightest separation take place after weeks. But the case is different if animal or vegetable matter be present, or that the solution be acidulated with a mineral acid; then the alkali leaves behind a yellow residuum, which on being washed, collected, and dried, proves to be pure or free sulphur. Rose also states that the separation of the oxides, that is, the arsenious and arsenic acids, from each other, is attended with difficulties which are insurmountable. It may, however, be accomplished in the following manner: acidulate the solution, if alkaline, or if the acids be combined with bases, with acetic acid, apply nitrate of silver, which will precipitate arsenic acid only, because nitrate of silver does not singly decompose arsenious acid; the quantity of arsenic acid is then estimated by the weight of the arseniate of silver, and which may be proved by subliming the metallic arsenic, weighing it, and adding to this weight the equivalents of oxygen, the sum of which will give the quantity of arsenic acid. The arsenious acid may then be separated, and its quantity estimated by well known processes, which it is needless here to describe.

"Such are the methods which, after much inquiry, I have been induced to prefer for the detection of arsenic and its compounds in medico-legal inquiries. The first objection is to obtain a solution of the arsenic, if possible. The next is to free this solution as much as possible from all volatile organized matter; because otherwise the resulting sulphuret is either retained in mechanical suspension, and therefore not separable without filtration, which should be avoided as far as possible, because in order to avoid loss, the whole filter, with its contents, must be deflagrated, and which renders the operation more intricate and troublesome: or which is of more importance as an objection is, that the sulphuret remains in solution in organic fluids, and therefore not precipitating, escapes analysis. When we can be certain that the arsenious acid is the form under which the poison has been administered, Dr. Christison's process is that by which the largest and purest proportion of sulphuret can be obtained. But under these circumstances the precipitated matters should not be lost sight of, for the arsenious acid is occasionally decomposed, and converted into sulphuret of arsenic, by sulphuretted hydrogen found in the stomach, an effect very likely to result from the instant action of the poison upon the coats of the viscus. Orfila also says that the arsenious acid is liable to be converted into arseniate of ammonia by the putrefactive decomposition of the animal textures, which sets in at long intervals after death. In such circumstances, Dr. Christison's process would throw down the arsenic, in the form of arseniate of silver, along with the animal matter, and it would thus escape analysis, unless the precipitate were examined. The destruction of the animal matter by nitric acid will not precipitate any of the soluble preparations of arsenic, and will dissolve many of those which are insoluble in simple distilled water. It also often peroxidates the arsenious, converting it into arsenic acid, a preparation far more soluble than the former. 'It is true,' Rose says, 'that the arsenious acid cannot be easily converted into the arsenic acid by means of nitric acid alone, but only by means of aqua regia.'* If, however, the operator is desirous of converting it with certainty into arsenic acid, it is easily done by the addition of liquid chlorine; or still better, by transmitting a current of chlorine gas for ten minutes, and boiling to expel the excess of chlorine. There is also the additional advantage of destroying the colour of the solution by means of chlorine. There is one thing, however, with respect to arsenic acid, of which the operator should be apprised, that arsenic acid, as has been correctly observed by Rose, is precipitated by sulphuretted hydrogen gas far more slowly than arsenious acid; consequently, the action must be kept up longer, and the hydro-sulphuretted solution should be heated, to expel any excess of sulphuretted hydrogen. 'Of all substances,' says Rose, 'that are acted on by sulphuretted hydrogen gas, arsenic acid is the one whose precipitation requires the greatest length of time. Besides this, a much *greater* quantity of the resulting sulphuret of arsenic *remains in solution* in the hydro-sulphuretted liquor than is the case when the arsenious acid is precipitated. The dissolved sulphuret can, nevertheless, be *fully* precipitated, by exposing the mixture to a very *gentle heat till it ceases to smell of sulphuretted hydrogen*.† Hence, then, when the preparation is the arsenic acid or some of its soluble compounds, or that the operator has endeavoured to convert the mineral into arsenic acid, the solution should be heated to expel the excess of sulphuretted hydrogen, and sufficient time allowed for the separation and subsidence of the arsenical sulphuret. Even when arsenic acid is present, and which might be at once precipitated by the simple application of nitrate of silver, I prefer precipitating the sulphuret, because this, with the subsequent deflagration and reprecipitation, in the form of arseniate of silver, are so many distinct identifications of the poison, the ultimate reduction of which to the metallic state must remove every particle of doubt from even the most sceptical."

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* Page 199, Griffin's Translation of Rose's Manual.

† Ibid, p. 202, 201.

33. *Is the Meat of Diseased Animals unwholesome?*—The following remarks on this subject, from the *Gazette Medicale*, for 20th of August last, though far from satisfying us of the innoxiousness of the meat of diseased animals, are nevertheless worthy of consideration. The subject is an interesting one, and should receive more attention than has hitherto been bestowed on it.

Among the investigations which the central council of health for the department du Nord has included in its report for 1830, to the prefect of Lille, there is a question which appears to us of very great interest, namely, whether the meat of kine attacked with tubercular affections proves injurious to the health of individuals eating it? The facts which led to this inquiry occurred recently at the Lille butchery; some of them are as follows:—In the middle of last January, a cow brought to market was suspected of being affected with the aforesaid disorder, and the police having been informed of it, summoned Messrs. Pommeret, a veterinary surgeon, and Simon Pers, a merchant butcher, both considered skilful in their avocations. After having examined the animal with great care, M. Pommeret declared it to be affected with the tuberculous disorder, which affection was limited to the lungs and pleuro costales, and appeared to have no connexion with other parts of the system: he was convinced that the animal in question, although slightly affected with tubercles, might be used as aliment, without producing any inconvenience to health.

Simon Pers the butcher, declared that the cow had its lungs and sides covered with small pimples, (boutons,) which constituted the disease called leprosy, on which account he thought its meat should not be exposed to sale, but buried, as not being fit aliment for man.

After this discordance in the opinions of two persons, both regarded as expert, the police called upon a third, who gave it as his opinion, that as the tuberculous affection was confined to the lungs and pleura, all other parts of the system appearing sound, the sale of the meat should be permitted, which was accordingly done.

A few days previous, a similar case occurred. A cow having been pronounced to be affected with leprosy and gangrene, was ordered to be buried. Messrs. Pommeret and Loiset, veterinary surgeons, repelled the charge of leprosy, none of the peculiar symptoms of which were found in the cow when examined, and which, besides, are only met with in swine. The designation of corrupted, (pourri,) which had been given to the animal, was considered by them as absurd and ridiculous, as they only recognised upon it a tuberculous affection, without any trace of other disease, and decided that the meat of the animal might be used as food without any inconvenience, and that permission to sell it should be given, which was accordingly granted.

These two facts go to prove, that at Lille, in the course of a few days, two cows, recognised as unquestionably labouring under the tuberculous disorder, have been used as nourishment by many hundreds of people, without causing any complaint. It is also well established, that this disorder is of more frequent occurrence than is generally supposed, especially in winter. It is fair to infer from this, that the meat of animals may be eaten without risk, whatever disease they may have when killed? The author of the report replies to this question by adducing the following facts:—

In all the large towns, and more particularly in Paris, dogs, and especially the valuable wild animals in the royal menagerie, are fed almost solely upon the flesh of horses.

Now, many of these horses are not only sick when slain, but are brought to the place after having already died of diseases; all are cut up alike, and made use of without giving rise to any inconvenience.

During the revolution, the professors of the school of Alfort, near Paris, caused a great number of horses, affected with farcie and glanders, to be taken into the forest of Vincennes, and there slain. The flesh of these was all eaten as fast as they came, by the inhabitants of the neighbouring villages, who, nevertheless remained free from any disease.

In the year 1737, the following fact was communicated to the Institute, by M. Hamel. A herd of cattle on its way from Limousin, stopped at an inn at Pitiviers, in Gatinois; one of the finest not being able to go further, was sold to a butcher, who killed it at the inn. The butcher's boy having placed his knife between his teeth, his tongue swelled, and he died five days afterwards, with a general gangrene. The innkeeper, who received a cut on one of his fingers, was attacked with a swelling on his arm, and died at the end of a week. His wife, who had received some of the blood upon the hand, had a tumour form on this part, and recovered with difficulty. Finally, a surgeon, who had opened one of the tumours, and placed his lancet between his wig and forehead, was attacked in this part with an erysipelas, which lasted a long time. Notwithstanding all this, says Hamel, all the meat of this animal was sold, and chiefly to the richest families; more than a hundred persons who eat of it, both roasted and boiled, found it excellent, and no one experienced the slightest inconvenience.

A dog, after having bitten seven cows, died a short time after with confirmed madness. Other dogs which he had bitten, were killed on showing indications of the same disease. The cows mentioned, soon exhibited symptoms of madness, notwithstanding which, they were butchered and distributed to customers, without either the milk, which had been drawn up to the time they were killed, or the meat having occasioned the least complaint from any of the inhabitants of Montargis, the village where this circumstance occurred.

In 1814, the allied troops carried in their march large flocks of cattle which they had pillaged. These having been over driven and badly attended to, were all seized with intense inflammation of the stomach, intestines, and liver. This disorder became contagious, and spread its ravages through the whole country, traversed by the army, especially at Paris and its environs. But the meat of none of the animals which died or laboured under this disorder, was suffered to be lost, all of it having been eaten by the strangers, citizens, soldiers, and lower classes: it was even consumed in the hospital. Nevertheless, there were no bad effects upon the health of individuals observed, and on the contrary, the typhus, which had preceded this epidemic, disappeared.

In 1815, the epidemic which occurred at the commencement of summer, continued till January, 1816. During six months of this epizootic, the allied troops received in their rations no other meat than that of animals that had laboured under typhus. On no table was any other meat eaten, but such as came from sick animals, and yet no persons were incommoded.

We have extracted from the report of the members of the central council, a case of each of the diseases most common among herbivorous animals: these having been reported by persons worthy of credit, we conclude with the authors of the memoir, that the reprobation attached to animals killed in a state of disease, and the repugnance universally manifested to eating their flesh from a persuasion of its being noxious to health, are altogether prejudices, which, for the interest of trade and the general welfare of man, should be done away. This is likewise the opinion of Messrs. Huzard, Darcet, Chaberet, Flandrin, Dupuy, and of a host of other savans, who have given particular attention to matters relating to public hygiene.

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34. *On Poisoning with Acetic Acid.*—In the *Journal de Chimie Medicale*, for August last, there is an account of some interesting experiments by M. Orfila, relative to poisoning by acetic acid. The following are M. Orfila's conclusions:—

1st. That the concentrated acetic acid is an active irritating poison, capable of speedily producing death in men and dogs when introduced into the stomach.

2d. That it occasions sanguineous exudation, afterwards softening and inflammation of the membranes of the intestinal canal, and sometimes even their perforation.

3d. That in most cases it produces a blackish colour, either general or partial of the mucous membrane of the stomach and bowels. This discolouration is the result of the chemical action of the acid on the blood; in fact, by its mixture with this concentrated acid, the blood, cooled and placed in a capsule, soon acquires the same tint.

4th. Common vinegar, in the dose of from four to five ounces, induces the same symptoms, and death in dogs of the common size, in from twelve to fifteen hours, unless it is vomited soon after being swallowed; in rather a larger dose it probably produces the same effects in man. If in opposition to this it is said that persons have swallowed a tumbler of vinegar without a fatal result, this doubtless depended upon the stomach of such persons being filled with food, and vomiting soon occurred.

MEDICAL STATISTICS.

35. *Births in Prussia.*—During the four years, 1826, 7, 8, and 9, the number of births in Prussia was 2,011,288; being 40,081 births for every million of inhabitants. The greater number of births occurred in the least densely inhabited districts. Of the whole number of births 988,507 were single, 11,346 twins, one hundred and forty-four triplets, and three quadruplets.—*Memorial Encyclopedique, for August,* 1831, *from the Berlin State Gazette.*

36. *Statistics of Calculous Diseases.*—In our seventh volume, p. 499, we noticed some interesting remarks on this subject, by Mr. Hutchinson, showing the infrequency of calculous diseases among seafaring people. Dr. Yelloly has pursued the investigation, and in an interesting paper in the *Philosophical Transactions*, for 1830, communicates much valuable information.

Dr. Y. states that in Ireland, calculus diseases are very rare. In various extensive districts, from which he has had returns, stone is entirely unknown; and in others it occurs with extreme infrequency. Thus in the counties of Antrim, Armagh, Londonderry, Donegal, Fermanagh, Tyrone, Carlow, Kildare, Kilkenney, and Longford; in King's county, and in the counties of Louth, Wicklow, Clare, Kerry, Galway, Roscommon, Tipperary, and Mayo, containing together, a population of above 3,500,000, not a single case of lithotomy has occurred in any of their respective hospitals since their establishment; nor has one example among the poor of these extensive districts, come within the cognizance of the practitioners who have furnished Dr. Y. with returns.

In the counties of Down, Monaghan, Leitrim, Sligo, Limerick, and Waterford, and in Queen's county, the population of which amounts together, to about 1,200,000 persons, nine cases of stone operation only have occurred during the whole time to which the records of the hospitals, or the information or inquiries of their medical officers extend, and which embrace a period little short of forty years. This is at the rate of not more than 0.25 per annum.

Dr. Yelloly's suspicion mentioned in a former paper that the principal occurrence of calculous diseases is in towns, is strengthened by his subsequent researches.

Soldiers appear to participate with sailors in their immunity from calculous disease. It appears from Sir James Macgregor's report on the diseases of the British army in the Peninsula, that between December, 1811, and June, 1814, of upwards of 330,000 cases admitted into general and regimental hospitals, no case of calculus presented itself. In the last fifteen cases only four cases of calculus have occurred in the English army in Britain, and only one case has occurred in the army in Ireland. In the two great French military hospitals Gros Caillou and Val-de-Grace, in thirty years, only six operations of lithotomy have been performed, five in the former, (four of which were soldiers and one a soldier's child,) and one in the latter. During six years that M. Gama has been chief surgeon of Val-de-Grace, and eight years previously that he exercised the same func-